



## REVEALING THE TREATMENT PLAN FOR ENDODONTIC PERIODONTIC LESIONS – CASE SERIES

### Endodontics

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### ABSTRACT

**Introduction:** An endodontic-periodontic lesion becomes a challenge for a clinician to diagnose and manage. when it comes to combined endodontic-periodontic lesion the most common treatment alternative is extraction and replacement with prosthesis. With numerous complications associated with prosthesis as well as patient's desire to retain natural teeth make it most important task for clinicians to conserve such teeth.

**Method:** Four patients were included in this case series. Cases were treated with endodontic and periodontic treatment sequentially as per the guidelines.

**Results:** After a follow-up period ranging from 6 months to 2 years, it was observed that all teeth remain asymptomatic and in normal function.

**Conclusions:** This case series shows that it is possible to change the prognosis of teeth affected by combined endodontic-periodontal lesions, provides that correct diagnosis and proper oral hygiene maintenance is implemented.

### KEYWORDS

Bone Graft, Endodontic-Periodontic lesion, GTR

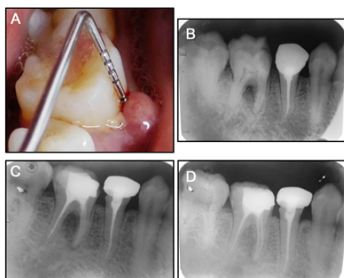
The interrelationship amongst the pulp and periodontal structures influence each other during function and disease. Pulpal and periodontal problems are accounts for more than 50% of the tooth mortality<sup>1</sup>. The actual relationship between periodontal and pulpal disease was first described by Simring and Goldberg in 1964<sup>2</sup>. Until recently, an endodontically involved tooth with an underlying periodontal pathology was considered to have a questionable prognosis. As a result, many teeth were sacrificed unnecessarily. Fortunately, the combined endodontic-periodontic lesion that affects a single tooth can now be diagnosed and treated successfully, with a predictable prognosis in many instances.

The aim of this case series was to present the diagnosis and management of various endodontic-periodontic lesions and to emphasize the importance of the correct treatment sequence. Here the lesions are classified per Simon's classification.<sup>3</sup>

### Primary Endodontic Lesion

#### Case 1

A 32-year-old female patient, with a noncontributory medical history was referred for the treatment of pain and intraoral localized swelling relation to the left mandibular first molar. Clinical and radiographic examinations revealed large caries and periapical and furcal lesions related to tooth #36 (Fig. 1). There was a localized swelling on the buccal gingiva in relation to lower right first molar. The tooth was grade I mobile and periodontal probing through the furcation showed increased probing values with tubular narrow localized pocket with grade II furcation defect (Fig. 1). An electric pulp test (Parkell Electronics Division, Farmingdale, NY) as well as cold test (Endo frost- Coltene alstatten, Switzerland) displayed negative response. Diagnosis was primary endodontic lesion without any periodontic involvement. Endodontic treatment was administered in two visits, with an inter appointment calcium hydroxide medication. No periodontal treatment was rendered (Fig 1).



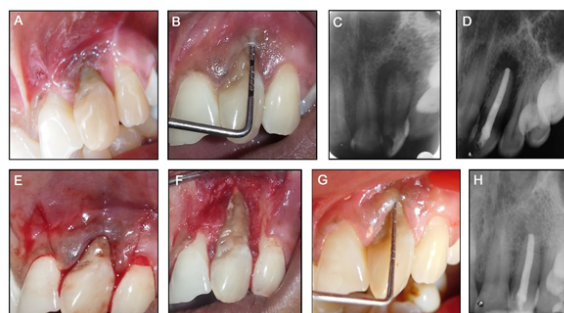
#### Figure 1

- A- Localized swelling on buccal gingiva with tubular narrow pocket extending below the furcation
- B- Preoperative radiograph of tooth #36 showing radiolucency of furcation area
- C- Immediate radiograph after root canal treatment of #36
- D- 6 months follow up radiograph showing complete healing at furcation area of #36

### Primary endodontic lesion with secondary periodontal involvement

#### Case 2

A 35-year-old woman presented to inquire about options for preserving tooth #22. Patient had history of trauma in childhood when she was 8 years old. The patient complained of periodic discharge of pus from the gingival sulcus, sensitivity on percussion, tooth mobility, and intermittent pain. Radiographs displayed open apex and a bony defect in the periapical area of tooth #22 (Fig. 2 A, B, C). Tooth vitality by thermal test revealed non-vital tooth. Tentative diagnosis was primary endodontic lesion (due to trauma) and endodontic treatment was performed. Treatment results were evaluated after 3 months, in radiograph the lesion remained the same with complain of periodic pus discharge from the labial sulcus leading to diagnosis of primary endodontic with secondary periodontic lesion. Therefore, periodontal surgery was planned for the treatment of the periodontal defect. (Fig 2 E, F). At 3 months follow up following surgery, no clinical sign and symptoms were present. A year later, recall radiograph showed complete healing of periapical defect and the patient wanted esthetic improvement of the recessed buccal gingiva of the affected tooth. (Fig. 2 G, H). Hence, the coronal replacement of flap surgery was done in relation to gingiva of #22. (Fig 3)



**Figure 2**

- A- Preoperative photograph of tooth #22
- B- Preoperative photograph of tooth #22 showing initial probing depth
- C- Preoperative radiograph showing open apex and a bony defect in periapical area of tooth #22
- D- Immediate postoperative radiograph after root canal treatment
- E- Photograph of intra crevicular and vertical releasing incision for periodontal surgery
- F- Photograph of absence of buccal cortical plate during periodontal surgery
- G- One year recalled photograph showing reduced probing depth
- H- One year recalled radiograph showing bony healing in periapical area of tooth #22

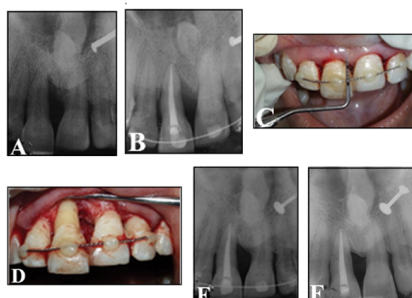
**Figure 3**

- I- Papilla based incision for coronal replacement of flap
- J- Reflection of flap and decortication of bone (arrow) for placement of bone graft
- K- GTR membrane cut to a specified size
- L- GTR membrane placed with bone graft material on surgical site
- M- Sutures taken with GTR
- N- Flap closed with sutures
- O- 6 months follow up photograph showing gingival coverage on recessed area
- P- 1 year follow up photograph showing gingival coverage
- Q- Total of 2 year follow up radiograph

### Primary periodontal lesion

#### Case 3

An 18-year-old female patient, came to our department with chief complain of mobility of #11. She also complained discomfort on chewing, related to tooth #11. Upon Clinical examination tooth was slightly extruded and periodontal probing depth was 10 mm at the mesial side of tooth #11. The tooth was vital on thermal vitality tests (Endo frost- Coltene alstatten, Switzerland). Tooth was grade II mobile and 1 mm extruded from the socket. Radiographic examination revealed a vertical bone loss in the mesial side of tooth #11 (Fig.4 A). No history of any traumatic incident was there and plaque and calculus was present on all teeth. So, the tentative diagnosis was of primary periodontal involvement (because of trauma from occlusion) without any endodontic involvement. After Scaling, teeth were stabilized by composite non-rigid splinting with 26-gauge orthodontic wire and Intentional root canal treatment completed before periodontal surgery (Fig.4 B). Hyperocclusion was relieved and periodontal surgery was done. At 6 months follow up radiograph showed initiation of bone repair in the defect. 1 year follow up showed continued healing and patient was asymptomatic. (Fig. 4).

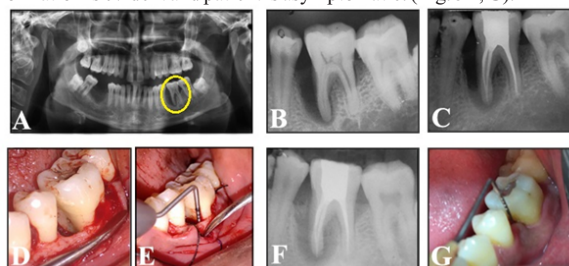
**Figure 4**

- A- Preoperative radiograph showing vertical bone loss in mesial side of tooth #11
- B- Radiograph after nonrigid splinting and intentional root canal treatment
- C- Preoperative photograph showing 10 mm pocket
- D- Photograph showing complete absence of alveolar bone up to the root apex on mesial and buccal aspect of tooth #11
- E- 6 months follow up radiograph showing initiation of bone healing mesial side of tooth #11
- F- One year follow up radiograph showing continued healing

### Primary periodontal lesion with secondary endodontic involvement

#### Case 4

A 35-year-old male patient, whose medical history was noncontributory, came to our department with a history of acute pain and localized swelling in the left mandibular molar area. Radiographic examination presented severe bone loss around the mesial root of tooth #36 (Fig. 5 A, B). The cause of the bone loss was considered related to overall periodontal involvement of dentition and diagnosed as aggressive periodontitis. The tooth #36 was nonresponsive to thermal vitality (Endo frost- Coltene alstatten, Switzerland) tests. It was a case of primary periodontic with secondary endodontic involvement. After completion of root canal treatment (Fig. 5 C), periodontal surgery was done. (Fig. 5 D, E). A 3-month recall radiograph showed initiation of bone repair in the bony defect. At 6 month and 2 years follow up bone formation is evident and patient is asymptomatic. (Fig. 5 F, G).

**Figure 5**

- A- Preoperative orthopantogram showing severe bone loss up to the apex of mesial root of tooth #36
- B- Preoperative radiograph showing severe bone loss up to the apex of mesial root of tooth #36
- C- Radiograph immediately after root canal treatment
- D- photograph of flap reflection during periodontal surgery
- E- Photograph of bone loss up to the root apex on the mesial side during periodontal surgery
- F- Two years follow up radiograph showing bone healing
- G- two years follow up photograph showing decreased probing depth

### DISCUSSION

Teeth involving both endodontic and periodontic lesions usually advised for extraction and replacement with dental implants, as per most of the prognostic classifications they are considered having hopeless prognosis. But implants have their own disadvantages of peri-implantitis of 18.8% of patients and 9.6% of implants<sup>4</sup> or 26% of patients and 16% of the implants<sup>5</sup> as shown in the studies. Some patients may require bone augmentation surgeries before implant placement increasing the patient morbidity. Also, replacement of teeth with prosthesis is associated with loss of proprioception of natural teeth and are not cost effective which is a major concern for the patients in developing countries. So, the conservation of natural teeth is up most important.

Treatment of each case will depend upon the extent of pulpal and periodontal tissue involved. Cause of the lesion, their pulpal condition and recommended treatment is illustrated in table 1.

**Table 1**

CAUSE	CONDITION OF PULP	RECOMMENDED TREATMENT
ENDODONTIC	NONVITAL	ENDODONTIC
PERIODONTIC	VITAL	PERIODONTIC
ENDO/PERIO	NONVITAL	ENDODONTIC FIRST

For only primary endodontic diseases appropriate endodontic therapy

is sufficient to result in healing of the lesion, as in case 1. If there is any doubt about the long-term prognosis of a tooth with a draining sinus that is masquerading as a periodontal pocket, then a series of long-term intracanal dressings can be utilized whilst the healing response is monitored<sup>6</sup>.

The prognosis in primary periodontal lesion depends wholly upon the efficacy of periodontal therapy and intentional endodontic treatment may be needed before any periodontal surgery if the bone loss is up to the apical third of the root, as done in case 3<sup>3,7</sup>.

In general, when primary disease of one tissue (pulp or periodontium) is present and secondary disease is just starting in the other, treatment of the primary disease will cure the secondary. When the secondary disease is established and chronic, both primary and secondary disease must be treated. Lesions of endodontic origin with secondary periodontal involvement should first be treated endodontically to take advantage of the normally excellent healing potential of an endodontic lesion. Residual periodontal lesions can then be treated after the response to endodontic therapy is evaluated as in case 2 and 4<sup>7</sup>. Diagnosis of primary endodontic and secondary periodontic lesion cannot be done at first visit and series of endodontic dressing may require. Non-resolving symptoms with adequate endodontic treatment may lead to diagnosis of secondary periodontal involvement of endodontic lesion (case 2).

In true combined type of endodontic-periodontal lesions, pulpal and periodontal tissues are affected simultaneously. Once it is established that both diseases are present then the clinician must determine whether the two diseases communicate via the periodontal pocket, so that appropriate treatment planning can be implemented. When in doubt as to whether the lesion is endodontic or periodontal in origin, endodontic therapy should generally be performed first because of its significantly better prognosis and minimal post-treatment sequelae.

Generally, it is better to provide the appropriate initial phases of treatment (e.g., root canal cleaning and medication plus root planing) before making any definite recommendations to the patient about other procedures, especially surgery or extraction. Many teeth can be saved with good quality care and with regular professional maintenance but, as with all aspects of periodontal disease, the patient must carry out meticulous oral hygiene procedures in the area in order to keep the tooth free of plaque and calculus.

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